A Business Process Management Approach in Virtual Entreprise Networks

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ABSTRACT

Virtual networks will enable a cluster of collaborating SMEs to behave as a single Virtual Internet Service Provider (VISP) for the production of tailored ISP services. This article case directly resulted from the need to increase competitiveness of Internet skilled SMEs.
It builds on standard workflows technologies for defining the business processes of a virtual enterprise and for standardizing ISP technical processes.
This system takes a top-down approach in the integration of Business System Support (BSS) and Operational System Support (OSS). The paper will feature application of service oriented architecture applied to business processed interaction across collaborative SMEs in virtual entreprise environment. The core components of the architecture are described supported by a proof of concept demonstrator evaluated in real organizational contexts.

Keywords: Virtual Enterprise, Virtual Networks, E-business, Service Oriented Architecture

1. INTRODUCTION

How do you develop winning IT strategies to meet key business objectives within your organization? What are the strategic imperatives associated with virtualization, consolidation and optimization? What does the future of virtualization look like? How can Computer Infrastructure Consolidation Optimization benefit from an increase in the flexibility of the infrastructure, while meeting the needs of a growing and changing business? Probably the biggest problem with the definition of business by size is the fact that each category is extremely broad. How does one distinguish between a company with 4 employees and sales under $2 millions and a company with 15 employees and sales of $15 millions? Both are small companies. Therefore, the SME designation, small and medium sized enterprises, is somewhat confusing. Nowhere is this more evident than on the Internet.
Some proponents of the Internet have stated that its real benefit in the current situation is that it will allow small and medium sized companies to be competitive with large multinational enterprises.

We do not completely agree with this position. We argue that the market power of large multinational corporations is so great that it dwarfs SME's in comparison. However, we would also point out that SME's using a strategic alliance methodology can achieve greater success in market penetration in global markets thereby affording them new business opportunities. So, while we do not view the Internet as giving SME's greater power in head to head business competition, we do see the potential of the Internet as an evolving global marketplace [1].

The importance of the virtual network can not be over emphasized in this context. The ability of companies to form global networks on the Internet will transform the way that we do business in the future. Service-oriented computing is becoming the prominent paradigm for leveraging inter-enterprise information systems to complete higher-order business transactions at the heart of the modus operandi of the virtual enterprise (VE). This paper describes research aimed at supporting the formation and operations of virtual enterprises through the setting-up of service-oriented workspace environments.

The paper argues that a role-based authorization approach to service invocation is necessary in order to enhance and guarantee the integrity of the transactions that take place in the business environment of a VE. The core components of the architecture are described supported by a proof of concept demonstrator evaluated in real organizational contexts.

2. DIGITAL ECONOMY

The development of the digital economy will be the set of strategies and actions to contribute to driving the competitivity of the country's productive sector by inserting it into the digital economy; which implies migrating from an economy with a scarce use of information technologies, to one where the use of these technologies is generalized in all economic, cultural and social activities. The generalized use of IT generates increases in the productivity and competitiveness of the economic agents, in this way contributing to the generation of well being and greater opportunities for progress.

Today, the Challenge in the world is of the change agents in the countries and through its technological and social components, has among one of its objectives, to accelerate the digital economy's development process in businesses, especially the micro, small and medium ones, for increasing the competitiveness of economy; as well as develop a digitalization culture in society, particularly in the consumers [3].

As the e-economy evolves, we must reexamine our beliefs about what can be achieved. New ideas and consumer demand trigger new business opportunities which proliferate so rapidly that three months in the e-economy is considered the equivalent of a full year in a traditional business development cycle. More than two thirds of businesses now have a web presence which offers product or catalog information for customer convenience. However, few organizations have really taken the trouble to find out what their channel partners need in terms of rapid information deployment to better manage the supply chain.

To grasp how the e-economy will affect your business, you need to think about how web technology is going to transform your relationship with your customers. During the next years, the supply chain model of the e-economy will bear little resemblance to today's model. Competitive forces and new technology will continuously alter the shape and flow of commerce [2].

To predict the future course of the emerging electronic economy we must consider what is happening now. Many companies have installed an Enterprise Resource Planning (ERP) software business model to handle their interaction with customers, suppliers, and other business partners (see figure 1). After a lot of expense, heartache, and prescriptive remedies, many fail to perform adequately. Why?

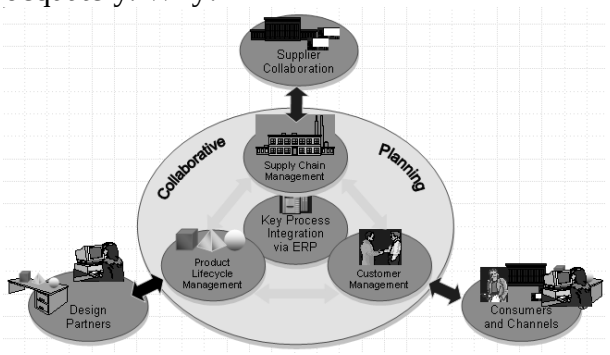


Figure 1. ERP overview

First of all, most ERP systems are, in the very nature of their design, focused on the manufacturing link of the supply chain. Yet, a fundamental shift in thinking is beginning to

concentrate on the demand side of the supply chain. The critical difference: demand chain thinking starts with the customer and works in reverse. The new approach acknowledges that customers have individual needs and service requirements. Another problem with most ERP business models is their inability to work seamlessly within an organization to handle some of the critical links of the supply chain process. The net result of awkward integration into other business systems within the supply chain has created a new industry of Integration Service Providers (ISPs) that link ERP systems. New ways of sharing information are gaining acceptance. These include Extensible Markup Language (XML), which offers a way to pass messages along the supply chain to inform those who require notification of occurrences that merit attention. The Internet, or in some cases extranets,provide the network-or highway by which these messages are transmitted. The ERP execution phases are:

- ERP product selection;
- Preparations;
- Production;
- Implementation;
- Post-Implementation.

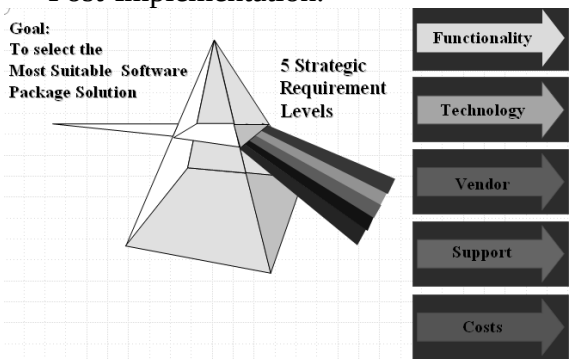


Figure 2. ERP product selection

Also, ERP Product selections Phase include:

- ERP Team formation for selection;
- Appointment of Consultants [if needed];
- Scoping study;
- Product selection;
- Implementation partners selection;
- Hardware/Communication cost estimation.

Product Selection – Parameters is:

- Reputation of the ERP product;
- No. of installations in the geographical vicinity;
- % of the overall functional availability;
- Customization possibilities;
- After sales support;
- Your investment plan & budget;
- Implementation partner's track record.

This new century heralds the coming of age for the electronic economy. With a tremendous knowledge base and the increase in bandwidth via digital subscriber lines, the capacity for processing information has increased tenfold. The desire to integrate the supply chain of businesses and consumers will generate even more change. existing communication frameworks are heading for extinction [4].

Let's consider business systems as they work today. A customer places a purchase order on his system that in turn becomes a sales order at the distribution center, with data flowing up the supply chain. Likewise, a payment becomes a receipt and the process is analogous to an upward movement of information [5].

Almost 70 percent of all database information is duplicated elsewhere, leaving many companies with the burden of expensive investments in computer hardware, software, and IT personnel to sustain the model. This represents a significant portion of doing business [6].

In the short term, the e-economy will enable customers to shop for products using their customized web browser ("the client shopping experience"). They will place the order or have an order automatically generated to replenish their inventory, all the while having online access to the latest information [9].

Currently, all of this information is processed and stored throughout the disparate systems of one's business partners, with each maintaining a copy of the same basic information.

What happens if we did away with unnecessary duplication and simply tracked the order on the Internet? If a change in a production schedule indicated a delivery delay, all of the affected parties could be easily notified. All of the issues associated with maintaining synchronized databases and customer information would eliminate significant costs from the supply chain.

The e-economy will propel us into a completely different business world, one far more efficient than the one we live in today. Users will define their own desktop "client experience" to cater to their part of the business process. Users will also subscribe to a network service in which the software will be downloaded. Version control will be easier because the system will recognize that a new version is available and proceed to

download it automatically. With storage networks, companies can still decide where they want their data to reside. Sensitive information may still be maintained locally but more often, data pieces will be distributed over the network for necessary access.

As enterprises gradually decentralize their operations and new networked business ecosystems start to find their way into profitable niche marketplaces, virtual, networked business teams gradually emerge as the wave of the future.

To be successful, virtual networked business teams need a strategic framework in which to operate. They also need good planning and in-depth project analysis, effective and accessible technologies, constant coaching, systematic fine-tuning, feedback processes and the full understanding that their success cannot be determined by a pre-designated set of communication technologies by itself.

But, until now, projects supported by virtual business teams have not been brought back major successes. Virtual teams are having major problems and managing their progress has been a superlative challenge for most. Organizations face for the first time the need to analyze and comprehend which are the key obstacles to the successful management of effective online collaborative business networks. Though the answer is not simple, the solution is to be found in examples that are closer to us than we have yet realized [7].

3. VIRTUAL COLLABORATION

Virtual collaboration for networked business teams is a complex and challenging activity in which there are major important components to be accounted for.

Virtual business teams do not operate like traditional physical teams, as their requirements reflect a whole new way of communicating, working collaboratively, sharing information and mutually supporting other team members. The new technologies and approaches required to achieve this are completely alien to most of our present organizational culture. And this is why they fail.

Cooperative processes are not the automatic results of implementing collaborative, real-time communication technologies, but the result of a carefully designed and systematically maintained virtual team development plan (see figure 3).

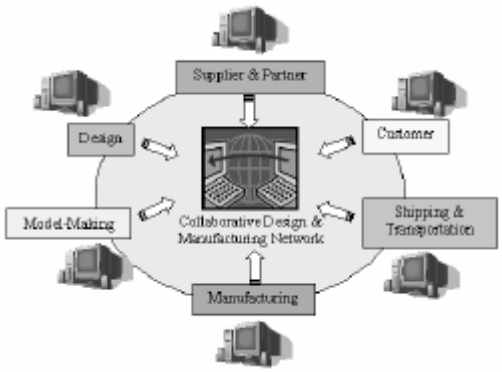


Figure 3. Web based integration for cooperative systems

For those of you who have already exposed themselves to the positive advantages made available by the use of cutting-edge communication and collaboration technologies, this should sound as a familiar melody. How many times have you been witness to technologically-based collaboration projects that have miserably failed? Why is there so much disjoint between technology potential and the productive use that business team members make of them? [3].

If the solution is not in the technology enabling such networked business teams to easily interoperate, where is it then? Who are virtual teams (see figure 4):

- Corporate Teams involving a collection of staff from different functions including IT and Key Business Functions;
- Collaborative Businesses Networks involve groups of businesses (SMEs) who have come together to operate as a collective in areas such as business development and product development;
- Collaborative Supply Chains generally centre round a major customer/OEM and a number of its suppliers. The major customer can mandate and encourage technology usage to a certain extent;

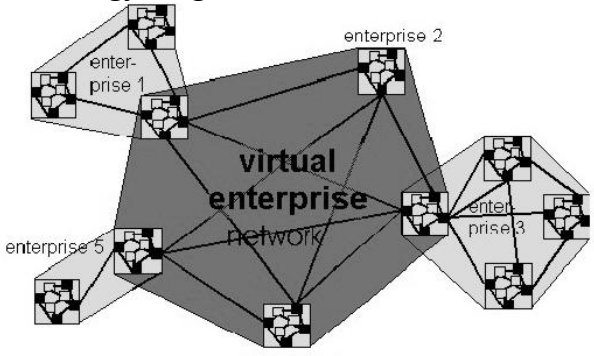


Figure 4. Cooperative entreprise projects

- Interdepartmental Government Teams are where a number of central or local government departments such as healthcare, economic development and education come together for a specific project;
- Inter-departmental and often inter-company;
- Inter- disciplinary with a mix of skills and professions from different functions;
- Project-based - formed to deliver a specific project by a specific deadline (rather than management or best practice sharing-oriented);
- Highly Mobile;
- "Political" with the need to manage the expectations of multiple stakeholders;
- High profile/high risk - engaged in strategic/creative work which is higher risk and more challenging than the typical work assignment;
- Multi-location - not based in a single location;
- Mixed Involvement of full-time and part-time players - typically a small inner core of full-timers complemented by a larger outer core of part-time reviewers and specialists.

The ideal solution framework suggests making a systematic pragmatical reference to the key interdependent components of a successful virtual business team - each of which must be set-up correctly and then kept in constant equilibrium as the team evolves and produces results.

These are:

- Shared Team Understanding (There are a number of key ideas, principles and rules that any successful virtual team needs to personalize and absorb in full);
- New Processes and Practices (Business virtual teams need to adopt and understand new work practices, sharing attitudes and communication modes to effectively empower the team they are part of);
- Ongoing Team Coaching (ust like a sports team a business team needs a coach so virtual teams do. The virtual team coach is a critically important component in helping the team find its identity and best way of operating)
- Holistic approach to Team Support Technology (Provided you have a clear blueprint for what is that it needs to be achieved by the Virtual Team, the best technology to use is not the one with the best feature set but the one you already have installed and every team member is able to use. So wherever possible it is better to integrate an organization's existing technology (intranet, extranet, team room, portal....) into the team support environment rather than scouting for the ultimate solution among new collaboration technologies. You may also need to plug some gaps but generally adding to, rather than replacing existing technology infrastructure is the proper way to go);

True understanding of the dynamic nature of networked business teams (A networked business team is a living thing).

4. A BUSINESS PROCESS MANAGEMENT APPROACH

The term Business Process Management (or BPM) is a set of activities which organizations can perform to either optimize their business processes or adapt them to new organizational needs. As these activities are usually aided by software tools, the term BPM is synonymously used to refer to the software tools themselves.

Business Process Management encompasses other process elements, such as Total Quality Management (TQM), Six Sigma, Performance Management, etc. Where Business Process Reengineering (popular in the 1990s) dealt with one-off changes to the organization, Business Process Management deals much more with the continuity and embedding of process-thinking and doing in the organization.

Business Process Management is not about technology but about management. Business Process Management activities are process design, process execution, and process monitoring.

Business driven development starts with modeling, then goes through implementation and testing, deployment to a server, and monitoring of the executing processes. Business Process Management is about service assembly, where applications are assembled from components. Components can be existing components, they can be generated by WebSphere Business Modeler, or they can be developed using tools such as Rational Software Architect and Rational Application Developer [2], [8].

We start with modeling the current system using WebSphere Business Modeler V6. In this phase

we create all the resources needed by our application like: timetables, human resources, data arrays, etc. We also define simple business measures such as key performance indicators (KPIs) which we want to verify in the final application trough monitoring. We export the process model for implementation (see figure 5).
In the second phase we implement the process model as an enterprise application in WebSphere Integration Developer. This can be done even with minimal programming knowledge [10].
We have to complete certain tasks by developing business rules, Java code, and a user interface for human tasks. The interface is very friendly and a basic GUI (Graphic User Interface) is created. Those default pages created for each human task can be further customized in order to facilitate the end user control. We export the application for deployment into the Process Server.
The Monitor Dashboard is used to display the business measures and KPIs to a business analyst. In the fifth phase we use the results of monitoring to compare the results with the model. Based on the analysis we modify the model and start a new cycle of implementation, deployment, and monitoring. This way even complex business models can be analyzed and optimized before they are implemented in real life situations.
The IBM process integration portfolio provides capabilities required for the delivery of the comprehensive enterprise wide business process management strategies and solution. It offers a holistic approach to transform and manage a business by aligning strategic and operational objectives with business activities and supporting IT services.

5. CONCLUSION

Today's virtual business teams don't appear to be able to fully leverage the much touted opportunities offered by always-on interconnectedness, easy access to unlimited information sources and real-time communication tools.

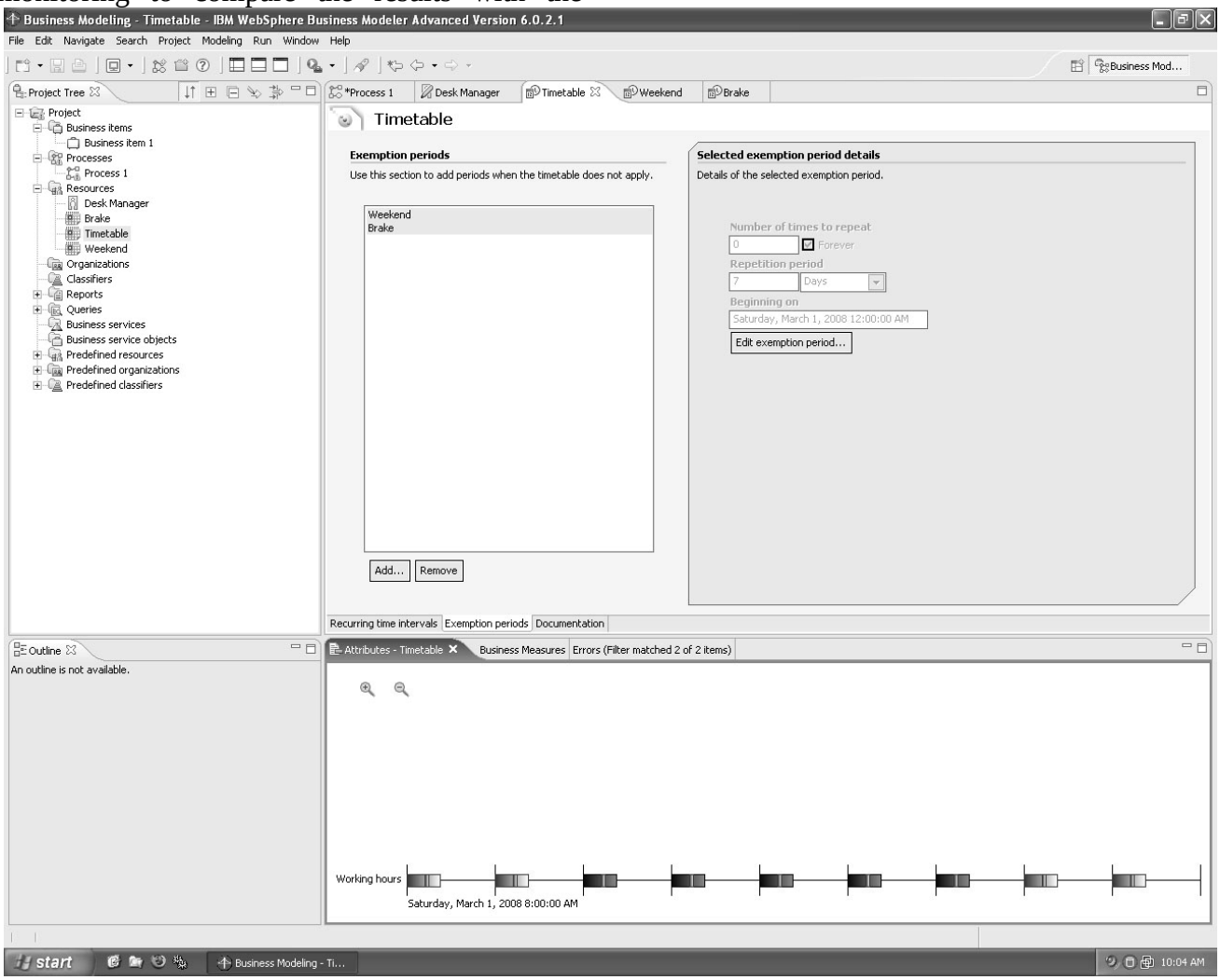


Figure 5. Business modeler resource definition

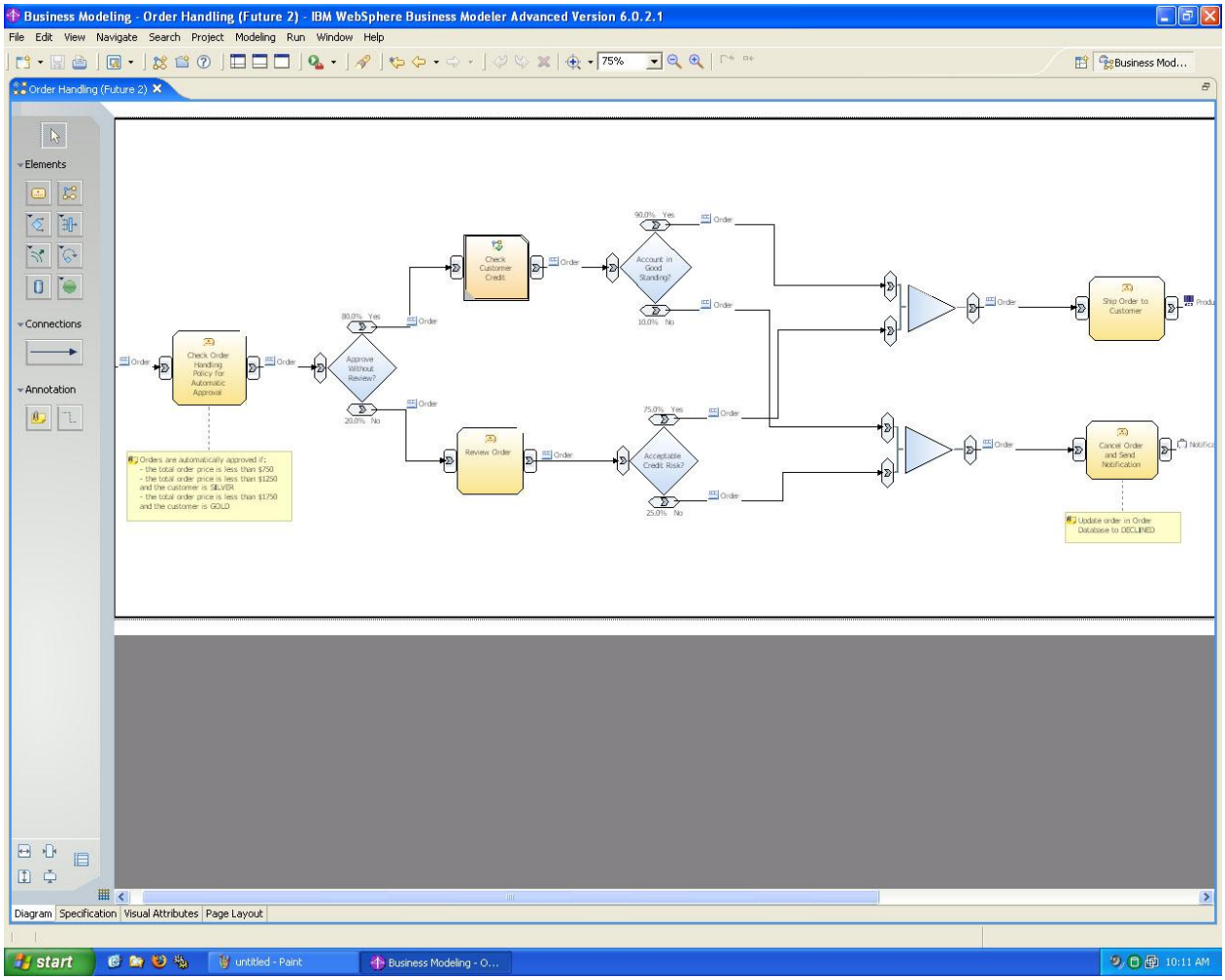


Figure 6. Business modeler process diagram

While much of the Internet-generated new media revolution talks about greater and more effective collaboration opportunities, business teams appear to be engulfed by:

- technology adoption issues;
- lack of effective communication approaches;
- reliance on old traditional work methods; absence of strong team motivation
- effective cooperative workflows.

The adoption of new tools without the parallel development of a new culture that supports their use and the potentialities opened by these new media scenarios is typical of all phases of technology adoption.

We have yet not uncovered the full potential available to us when we operate, like nature operates, as cooperative, highly motivated teams.atterns, command - structure, communication methods that can provide us with useful guidelines on how teams need to operate to be truly successful.

It is our goal to analyze these principles and to see where and how some of the teaming principles can be transferred to the areas of organizational design, leadership, online collaboration, business networking, and human resources management.

Building an e-economy for the 21st century is a complex challenge. It requires:

- transform business models and organizational structures in the private and public sectors to generate continuous streams of productivity gains and product innovations, through the applications and use of ICTs;
- create a climate of trust among consumers and businesses that fosters the growth of the e-economy in each country and internationally and creates global markets for electronic goods and services; and

- build an intelligent infrastructure to serve as the backbone of the e-economy – by encouraging investment, strengthening research, enhancing commercialization and ensuring that all persons have access to this infrastructure and know how to use it.

Developing and implementing these strategies will require partnership and collaboration among the private, public and academic sectors as well as other agencies and organizations that strive to link these together. It will also require the active involvement of consumers and citizens.

Also, today, the critical and strategically questions are:

- What overall strategies are needed to catalyze actions that respond successfully to the opportunities and challenges presented by the e-economy?
- Are there other factors in addition to those already identified that are yet to be understood or fully harnessed, and that will enable each enterprise to benefit more fully as we progress towards a mature e-economy?
- What is needed to make the e-economy a priority?
- How can the different stakeholder groups build on the partnership model that was developed as part of the e-Commerce Strategy?
- What additional measures are needed to address the broader challenges of the e-economy?

Enterprises are now facing growing global competition and the continual success in the marketplace depends very much on how efficient and effective the companies are able to respond to customer demands.

The formation of virtual enterprise network is taking up momentum to meet this challenge. The idea of virtual enterprise network is meant to establish a dynamic organization by the synergetic combination of dissimilar companies with different core competencies, thereby forming a "best of everything" consortium to perform a given business project to achieve maximum degree of customer satisfaction.

In this emerging business model of virtual enterprise network, the decision support functionality, which addresses the issues such as selection of business partners, coordination in the distribution of production processes and the prediction of production problems, is an important domain to be studied.

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